

## SEQUENCE LISTING

<110> FUKUI, YOSHINORI  
SASAZUKI, TAKEHIKO

<120> FUNCTIONAL DOMAIN AND ASSOCIATED MOLECULE OF DOCK2  
ESSENTIALLY REQUIRED IN LYMPHOCYTE MIGRATION

<130> 024918-0123

<140> 10/535,223

<141> 2005-05-17

<150> PCT/JP03/014538

<151> 2003-11-14

<150> JP 2002-342683

<151> 2002-11-26

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<170> PatentIn Ver. 3.3

<210> 1

<211> 1828

<212> PRT

<213> Mus musculus

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Asp Val Val Arg Ile Gln Glu Thr Cys Gly Asp Trp Tyr Arg Gly Tyr  
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Leu Ile Lys His Lys Leu Ser Gln Gly Ile Phe Pro Thr Ser Phe Ile  
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His Leu Lys Glu Val Thr Val Glu Lys Arg Arg Asn Ile Glu Asn Ile  
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Ile Pro Ala Glu Ile Pro Leu Ala Gln Glu Val Thr Thr Thr Leu Trp  
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Glu Trp Gly Ser Ile Trp Lys Gln Leu Tyr Val Ala Ser Lys Lys Glu  
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Arg Phe Leu Gln Val Gln Ser Met Met Tyr Asp Leu Met Glu Trp Arg  
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Ser Gln Leu Leu Ser Gly Thr Leu Pro Lys Asp Glu Leu Lys Glu Leu  
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Lys Gln Lys Val Thr Ser Lys Ile Asp Tyr Gly Asn Lys Ile Leu Glu  
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Leu Asp Leu Ile Val Arg Asp Glu Asp Gly Asn Ile Leu Asp Pro Asp  
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 Lys Thr Ser Val Ile Ser Leu Phe His Ala His Glu Glu Ala Thr Tyr  
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 Lys Ile Thr Glu Arg Ile Lys Glu Glu Met Ser Lys Asp Gln Pro Asp  
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 Tyr Gly Val Tyr Ser Arg Ile Ser Ser Ser Pro Thr His Ser Leu Tyr  
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 Val Phe Val Arg Asn Phe Val Cys Arg Ile Gly Glu Asp Ala Glu Leu  
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 245 250 255  
 Tyr Leu Val Arg Trp Gly Ser Lys Gly Phe Pro Lys Glu Ile Glu Met  
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 Val Asp Arg Thr Thr Val Val Ala Arg Lys Leu Gly Phe Pro Glu Ile  
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 Gly Asp Phe Asp Lys Tyr Thr Lys Thr Thr Gln Arg Asn Val Glu Val  
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Cys	Val	Gly	Ala	Gly	Asp	Lys	Ala	Met	Asn	Glu	Tyr	His	Ser	Val	Val	
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Tyr	Tyr	Gln	Val	Lys	Gln	Pro	Arg	Trp	Met	Glu	Thr	Val	Lys	Val	Ala	
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Val	Pro	Ile	Glu	Asp	Met	Gln	Arg	Ile	His	Leu	Arg	Phe	Met	Phe	Arg	
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Met	Ser	Tyr	Val	Lys	Leu	Met	Lys	Glu	Asp	Gly	Thr	Thr	Leu	His	Asp	
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Gly	Tyr	His	Glu	Leu	Val	Val	Leu	Lys	Gly	Asp	Ser	Lys	Lys	Met	Glu	
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Ser	Val	Ser	Ser	Arg	Asp	Val	Phe	Ser	Ile	Ser	Thr	Leu	Val	Cys	Ser	
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Thr	Lys	Leu	Thr	Gln	Asn	Val	Gly	Leu	Leu	Gly	Leu	Leu	Lys	Trp	Arg	
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Ser	Val	Leu	His	Asp	Val	Glu	Thr	Val	Phe	Asp	Ala	Lys	Leu	Leu	Ser	805	810	815	
Gln	Leu	Leu	Tyr	Glu	Phe	Tyr	Thr	Cys	Ile	Pro	Pro	Val	Lys	Leu	Gln	820	825	830	
Lys	Gln	Lys	Val	Gln	Ser	Met	Asn	Glu	Ile	Val	Gln	Ser	Asn	Leu	Phe	835	840	845	
Lys	Lys	Gln	Glu	Cys	Arg	Asp	Ile	Leu	Leu	Pro	Val	Ile	Thr	Lys	Glu	850	855	860	
Leu	Lys	Glu	Leu	Leu	Glu	Gln	Arg	Asp	Asp	Gly	Gln	His	Gln	Ala	Glu	865	870	875	880
Lys	Lys	His	Cys	Val	Glu	Leu	Leu	Asn	Ser	Ile	Leu	Glu	Val	Leu	Ser	885	890	895	
Cys	Gln	Asp	Ala	Ala	Phe	Thr	Tyr	Asp	His	Ile	Gln	Glu	Ile	Met	Val	900	905	910	
Gln	Leu	Leu	Arg	Thr	Val	Asn	Arg	Thr	Val	Ile	Thr	Met	Gly	Arg	Asp	915	920	925	
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Gln	Met	Gly	Asp	Gln	His	Tyr	Ser	Phe	Tyr	Ile	Glu	Thr	Phe	Gln	Thr	945	950	955	960
Ser	Ser	Asp	Leu	Val	Asp	Phe	Leu	Met	Glu	Thr	Phe	Ile	Met	Phe	Lys	965	970	975	
Asp	Leu	Ile	Gly	Lys	Asn	Val	Tyr	Pro	Gly	Asp	Trp	Met	Ala	Met	Ser	980	985	990	
Met	Val	Gln	Asn	Arg	Val	Phe	Leu	Arg	Ala	Ile	Asn	Lys	Phe	Ala	Glu	995	1000	1005	
Thr	Met	Asn	Gln	Lys	Phe	Leu	Glu	His	Thr	Ser	Phe	Glu	Phe	Gln	Leu	1010	1015	1020	
Trp	Asn	Asn	Tyr	Phe	His	Leu	Ala	Val	Ala	Phe	Ile	Thr	Gln	Asp	Ser	1025	1030	1035	1040
Leu	Gln	Leu	Glu	Gln	Phe	Thr	His	Ala	Lys	Tyr	Asn	Lys	Ile	Leu	Asn	1045	1050	1055	
Lys	Tyr	Gly	Asp	Met	Arg	Arg	Leu	Ile	Gly	Phe	Ser	Ile	Arg	Asp	Met	1060	1065	1070	

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Ala Thr Ile Pro Ile Phe Phe Asp Met Met Leu Cys Glu Tyr Gln Arg  
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Thr Gly Ala Phe Lys Lys Phe Glu Asn Glu Ile Ile Leu Lys Leu Asp  
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His Glu Val Glu Gly Gly Arg Gly Asp Glu Gln Tyr Met Gln Leu Leu  
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Glu Ser Ile Leu Met Glu Cys Thr Ala Glu His Pro Thr Ile Ala Lys  
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Ser Val Glu Asn Phe Val Ser Leu Val Lys Gly Leu Leu Glu Lys Leu  
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Leu Asp Tyr Arg Gly Val Met Thr Asp Glu Ser Lys Asp Asn Arg Met  
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Ser Cys Thr Val Asn Leu Leu Asn Phe Tyr Lys Asp Asn Asn Arg Glu  
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Glu Met Tyr Ile Arg Tyr Leu Tyr Lys Leu Arg Asp Leu His Leu Asp  
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Cys Glu Asn Tyr Thr Glu Ala Ala Tyr Thr Leu Leu Leu His Thr Trp  
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Gly Gln Gln His Pro Gln Thr His Arg Gln Leu Lys Glu Thr Leu Tyr  
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Glu Thr Ile Ile Gly Tyr Phe Asp Lys Gly Lys Met Trp Glu Glu Ala  
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Glu Asn Ile Met Lys Ile Leu Arg Thr Lys Pro Asp Tyr Phe Ala Val  
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Gly Tyr Tyr Gly Gln Gly Phe Pro Ser Phe Leu Arg Asn Lys Val Phe  
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 Thr Val Gln Pro Val Leu Asp Glu His Pro Arg Phe Lys Asn Lys Pro  
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 Phe His Tyr Ser Arg Pro Val Arg Arg Gly Lys Val Asp Pro Glu Asn  
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 Glu Phe Ala Ser Met Trp Ile Glu Arg Thr Ser Phe Leu Thr Ala Tyr  
 1460 1465 1470  
 Lys Leu Pro Gly Ile Leu Arg Trp Phe Glu Val Val His Met Ser Gln  
 1475 1480 1485  
 Thr Thr Ile Ser Pro Leu Glu Asn Ala Ile Glu Thr Met Ser Thr Val  
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 Asn Glu Lys Ile Leu Met Met Ile Asn Gln Tyr Gln Ser Asp Glu Ser  
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 Ala Val Met Gly Gly Phe Ala Lys Tyr Glu Lys Ala Phe Phe Thr Glu  
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 Glu Tyr Ser Arg Glu His Pro Glu Asp Gln Asp Lys Leu Ser His Leu  
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 Lys Asp Leu Ile Ala Trp Gln Ile Pro Phe Leu Gly Ala Gly Ile Lys  
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 Gly Val Arg Glu Met Pro Asp Phe Glu Asp Arg Arg Val Gly Arg Pro  
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 Ser Met His Ser Asp Cys Ser Thr Pro Ser Lys Val Pro Ala Glu Ser  
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 Phe Asp Leu Glu Ser Ala Pro Pro Lys Thr Pro Lys Val Glu Glu Glu  
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Pro Ile Ser Pro Gly Ser Thr Leu Pro Glu Val Lys Leu Arg Arg Ser  
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Lys Lys Arg Thr Lys Arg Ser Ser Val Val Phe Ala Asp Glu Lys Ala  
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Ala Thr Glu Ser Asp Leu Lys Arg Leu Ser Arg Lys Gln Glu Phe Met  
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Ser Asp Thr Asn Leu Ser Glu His Ala Ala Ile Pro Ala Arg Val Ser  
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Ile Leu Ser Gln Met Ser Phe Ala Ser Gln Ser Met Pro Thr Ile Pro  
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Ala Leu Thr Leu Ser Val Ala Gly Val Pro Gly Leu Asp Glu Ala Asn  
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Thr Ser Pro Arg Leu Ser Gln Thr Phe Phe Gln Val Ser Asp Gly Asp  
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Lys Lys Thr Leu Lys Lys Lys Lys Val Asn Gln Phe Phe Lys Thr Met  
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Ser Thr Asn Met  
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Asp Val Val Arg Ile Gln Glu Thr Cys Gly Asp Trp Tyr Arg Gly Tyr  
 35 40 45

Leu Ile Lys His Lys Met Leu Gln Gly Ile Phe Pro Lys Ser Phe Ile  
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His Ile Lys Glu Val Thr Val Glu Lys Arg Arg Asn Thr Glu Asn Ile  
 65 70 75 80

Ile Pro Ala Glu Ile Pro Leu Ala Gln Glu Val Thr Thr Thr Leu Trp  
 85 90 95

Glu Trp Gly Ser Ile Trp Lys Gln Leu Tyr Val Ala Ser Lys Lys Glu  
 100 105 110

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Lys	Gln	Lys	Val	Thr	Ser	Lys	Ile	Asp	Tyr	Gly	Asn	Lys	Ile	Leu	Glu	145	150	155
Leu	Asp	Leu	Ile	Val	Arg	Asp	Glu	Asp	Gly	Asn	Ile	Leu	Asp	Pro	Asp	165	170	175
Asn	Thr	Ser	Val	Ile	Ser	Leu	Phe	His	Ala	His	Glu	Glu	Ala	Thr	Asp	180	185	190
Lys	Ile	Thr	Glu	Arg	Ile	Lys	Glu	Glu	Met	Ser	Lys	Asp	Gln	Pro	Asp	195	200	205
Tyr	Ala	Met	Tyr	Ser	Arg	Ile	Ser	Ser	Ser	Pro	Thr	His	Ser	Leu	Tyr	210	215	220
Val	Phe	Val	Arg	Asn	Phe	Val	Cys	Arg	Ile	Gly	Glu	Asp	Ala	Glu	Leu	225	230	235
Phe	Met	Ser	Leu	Tyr	Asp	Pro	Asn	Lys	Gln	Thr	Val	Ile	Ser	Glu	Asn	245	250	255
Tyr	Leu	Val	Arg	Trp	Gly	Ser	Arg	Gly	Phe	Pro	Lys	Glu	Ile	Glu	Met	260	265	270
Leu	Asn	Asn	Leu	Lys	Val	Val	Phe	Thr	Asp	Leu	Gly	Asn	Lys	Asp	Leu	275	280	285
Asn	Arg	Asp	Lys	Ile	Tyr	Leu	Ile	Cys	Gln	Ile	Val	Arg	Val	Gly	Lys	290	295	300
Met	Asp	Leu	Lys	Asp	Thr	Gly	Ala	Lys	Lys	Cys	Thr	Gln	Gly	Leu	Arg	305	310	315
Arg	Pro	Phe	Gly	Val	Ala	Val	Met	Asp	Ile	Thr	Asp	Ile	Ile	Lys	Gly	325	330	335
Lys	Ala	Glu	Ser	Asp	Glu	Glu	Lys	Gln	His	Phe	Ile	Pro	Phe	His	Pro	340	345	350
Val	Thr	Ala	Glu	Asn	Asp	Phe	Leu	His	Ser	Leu	Leu	Gly	Lys	Val	Ile	355	360	365
Ala	Ser	Lys	Gly	Asp	Ser	Gly	Gly	Gln	Gly	Leu	Trp	Val	Thr	Met	Lys	370	375	380
Met	Leu	Val	Gly	Asp	Ile	Ile	Gln	Ile	Arg	Lys	Asp	Tyr	Pro	His	Leu	385	390	395
Val	Asp	Arg	Thr	Thr	Val	Val	Ala	Arg	Lys	Leu	Gly	Phe	Pro	Glu	Ile	405	410	415

Ile	Met	Pro	Gly	Asp	Val	Arg	Asn	Asp	Ile	Tyr	Ile	Thr	Leu	Leu	Gln	420	425	430	
Gly	Asp	Phe	Asp	Lys	Tyr	Asn	Lys	Thr	Thr	Gln	Arg	Asn	Val	Glu	Val	435	440	445	
Ile	Met	Cys	Val	Cys	Ala	Glu	Asp	Gly	Lys	Thr	Leu	Pro	Asn	Ala	Ile	450	455	460	
Cys	Val	Gly	Ala	Gly	Asp	Lys	Pro	Met	Asn	Glu	Tyr	Arg	Ser	Val	Val	465	470	475	480
Tyr	Tyr	Gln	Val	Lys	Gln	Pro	Arg	Trp	Met	Glu	Thr	Val	Lys	Val	Ala	485	490	495	
Val	Pro	Ile	Glu	Asp	Met	Gln	Arg	Ile	His	Leu	Arg	Phe	Met	Phe	Arg	500	505	510	
His	Arg	Ser	Ser	Leu	Glu	Ser	Lys	Asp	Lys	Gly	Glu	Lys	Asn	Phe	Ala	515	520	525	
Met	Ser	Tyr	Val	Lys	Leu	Met	Lys	Glu	Asp	Gly	Thr	Thr	Leu	His	Asp	530	535	540	
Gly	Phe	His	Asp	Leu	Val	Val	Leu	Lys	Gly	Asp	Ser	Lys	Lys	Met	Glu	545	550	555	560
Asp	Ala	Ser	Ala	Tyr	Leu	Thr	Leu	Pro	Ser	Tyr	Arg	His	His	Val	Glu	565	570	575	
Asn	Lys	Gly	Ala	Thr	Leu	Ser	Arg	Ser	Ser	Ser	Ser	Val	Gly	Gly	Leu	580	585	590	
Ser	Val	Ser	Ser	Arg	Asp	Val	Phe	Ser	Ile	Ser	Thr	Leu	Val	Cys	Ser	595	600	605	
Thr	Lys	Leu	Thr	Gln	Asn	Val	Gly	Leu	Leu	Gly	Leu	Leu	Lys	Trp	Arg	610	615	620	
Met	Lys	Pro	Gln	Leu	Leu	Gln	Glu	Asn	Leu	Glu	Lys	Leu	Lys	Ile	Val	625	630	635	640
Asp	Gly	Glu	Glu	Val	Val	Lys	Phe	Leu	Gln	Asp	Thr	Leu	Asp	Ala	Leu	645	650	655	
Phe	Asn	Ile	Met	Met	Glu	His	Ser	Gln	Ser	Asp	Glu	Tyr	Asp	Ile	Leu	660	665	670	
Val	Phe	Asp	Ala	Leu	Ile	Tyr	Ile	Ile	Gly	Leu	Ile	Ala	Asp	Arg	Lys	675	680	685	
Phe	Gln	His	Phe	Asn	Thr	Val	Leu	Glu	Ala	Tyr	Ile	Gln	Gln	His	Phe	690	695	700	
Ser	Ala	Thr	Leu	Ala	Tyr	Lys	Lys	Leu	Met	Thr	Val	Leu	Lys	Thr	Tyr	705	710	715	720

Leu	Asp	Thr	Ser	Ser	Arg	Gly	Glu	Gln	Cys	Glu	Pro	Ile	Leu	Arg	Thr	725	730	735	
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Leu	Phe	Ser	Gln	Leu	Tyr	Glu	Gly	Lys	Glu	Gln	Met	Glu	Phe	Glu	Glu	755	760	765	
Ser	Met	Arg	Arg	Leu	Phe	Glu	Ser	Ile	Asn	Asn	Leu	Met	Lys	Ser	Gln	770	775	780	
Tyr	Lys	Thr	Thr	Ile	Leu	Leu	Gln	Val	Ala	Ala	Leu	Lys	Tyr	Ile	Pro	785	790	795	800
Ser	Val	Leu	His	Asp	Val	Glu	Met	Val	Phe	Asp	Ala	Lys	Leu	Leu	Ser	805	810	815	
Gln	Leu	Leu	Tyr	Glu	Phe	Tyr	Thr	Cys	Ile	Pro	Pro	Val	Lys	Leu	Gln	820	825	830	
Lys	Gln	Lys	Val	Gln	Ser	Met	Asn	Glu	Ile	Val	Gln	Ser	Asn	Leu	Phe	835	840	845	
Lys	Lys	Gln	Glu	Cys	Arg	Asp	Ile	Leu	Leu	Pro	Val	Ile	Thr	Lys	Glu	850	855	860	
Leu	Lys	Glu	Leu	Leu	Glu	Gln	Lys	Asp	Asp	Met	Gln	His	Gln	Val	Leu	865	870	875	880
Glu	Arg	Lys	Tyr	Cys	Val	Glu	Leu	Leu	Asn	Ser	Ile	Leu	Glu	Val	Leu	885	890	895	
Ser	Tyr	Gln	Asp	Ala	Ala	Phe	Thr	Tyr	His	His	Ile	Gln	Glu	Ile	Met	900	905	910	
Val	Gln	Leu	Leu	Arg	Thr	Val	Asn	Arg	Thr	Val	Ile	Thr	Met	Gly	Arg	915	920	925	
Asp	His	Ile	Leu	Ile	Ser	His	Phe	Val	Ala	Cys	Met	Thr	Ala	Ile	Leu	930	935	940	
Asn	Gln	Met	Gly	Asp	Gln	His	Tyr	Ser	Phe	Tyr	Ile	Glu	Thr	Phe	Gln	945	950	955	960
Thr	Ser	Ser	Glu	Leu	Val	Asp	Phe	Leu	Met	Glu	Thr	Phe	Ile	Met	Phe	965	970	975	
Lys	Asp	Leu	Ile	Gly	Lys	Asn	Val	Tyr	Pro	Gly	Asp	Trp	Met	Ala	Met	980	985	990	
Ser	Met	Val	Gln	Asn	Arg	Val	Phe	Leu	Arg	Ala	Ile	Asn	Lys	Phe	Ala	995	1000	1005	
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 Ser Leu Gln Leu Glu Gln Phe Ser His Ala Lys Tyr Asn Lys Ile Leu  
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 Arg Ser Gly Asp Phe Lys Lys Phe Glu Asn Glu Ile Ile Leu Lys Leu  
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 Ala Ile Ser Leu Cys Lys Glu Leu Ala Glu Gln Tyr Glu Met Glu Ile  
 1300 1305 1310  
 Phe Asp Tyr Glu Leu Leu Ser Gln Asn Leu Ile Gln Gln Ala Lys Phe  
 1315 1320 1325

Tyr Glu Ser Ile Met Lys Ile Leu Arg Pro Lys Pro Asp Tyr Phe Ala  
 1330 1335 1340

Val Gly Tyr Tyr Gly Gln Gly Phe Pro Ser Phe Leu Arg Asn Lys Val  
 1345 1350 1355 1360

Phe Ile Tyr Arg Gly Lys Glu Tyr Glu Arg Arg Glu Asp Phe Gln Met  
 1365 1370 1375

Gln Leu Met Thr Gln Phe Pro Asn Ala Glu Lys Met Asn Thr Thr Ser  
 1380 1385 1390

Ala Pro Gly Asp Asp Val Lys Asn Ala Pro Gly Gln Tyr Ile Gln Cys  
 1395 1400 1405

Phe Thr Val Gln Pro Val Leu Asp Glu His Pro Arg Phe Lys Asn Lys  
 1410 1415 1420

Pro Val Pro Asp Gln Ile Ile Asn Phe Tyr Lys Ser Asn Tyr Val Gln  
 1425 1430 1435 1440

Arg Phe His Tyr Ser Arg Pro Val Arg Arg Gly Thr Val Asp Pro Glu  
 1445 1450 1455

Asn Glu Phe Ala Ser Met Trp Ile Glu Arg Thr Ser Phe Val Thr Ala  
 1460 1465 1470

Tyr Lys Leu Pro Gly Ile Leu Arg Trp Phe Glu Val Val His Met Ser  
 1475 1480 1485

Gln Thr Thr Ile Ser Pro Leu Glu Asn Ala Ile Glu Thr Met Ser Thr  
 1490 1495 1500

Ala Asn Glu Lys Ile Leu Met Met Ile Asn Gln Tyr Gln Ser Asp Glu  
 1505 1510 1515 1520

Thr Leu Pro Ile Asn Pro Leu Ser Met Leu Leu Asn Gly Ile Val Asp  
 1525 1530 1535

Pro Ala Val Met Gly Gly Phe Ala Lys Tyr Glu Lys Ala Phe Phe Thr  
 1540 1545 1550

Glu Glu Tyr Val Arg Asp His Pro Glu Asp Gln Asp Lys Leu Thr His  
 1555 1560 1565

Leu Lys Asp Leu Ile Ala Trp Gln Ile Pro Phe Leu Gly Ala Gly Ile  
 1570 1575 1580

Lys Ile His Glu Lys Arg Val Ser Asp Asn Leu Arg Pro Phe His Asp  
 1585 1590 1595 1600

Arg Met Glu Glu Cys Phe Lys Asn Leu Lys Met Lys Val Glu Lys Glu  
 1605 1610 1615

Tyr Gly Val Arg Glu Met Pro Asp Phe Asp Asp Arg Arg Val Gly Arg  
 1620 1625 1630

Pro Arg Ser Met Leu Arg Ser Tyr Arg Gln Met Ser Ile Ile Ser Leu  
 1635 1640 1645

Ala Ser Met Asn Ser Asp Cys Ser Thr Pro Ser Lys Pro Thr Ser Glu  
 1650 1655 1660

Ser Phe Asp Leu Glu Leu Ala Ser Pro Lys Thr Pro Arg Val Glu Gln  
 1665 1670 1675 1680

Glu Glu Pro Ile Ser Pro Gly Ser Thr Leu Pro Glu Val Lys Leu Arg  
 1685 1690 1695

Arg Ser Lys Lys Arg Thr Lys Arg Ser Ser Val Val Phe Ala Asp Glu  
 1700 1705 1710

Lys Ala Ala Ala Glu Ser Asp Leu Lys Arg Leu Ser Arg Lys His Glu  
 1715 1720 1725

Phe Met Ser Asp Thr Asn Leu Ser Glu His Ala Ala Ile Pro Leu Lys  
 1730 1735 1740

Ala Ser Val Leu Ser Gln Met Ser Phe Ala Ser Gln Ser Met Pro Thr  
 1745 1750 1755 1760

Ile Pro Ala Leu Ala Leu Ser Val Ala Gly Ile Pro Gly Leu Asp Glu  
 1765 1770 1775

Ala Asn Thr Ser Pro Arg Leu Ser Gln Thr Phe Leu Gln Leu Ser Asp  
 1780 1785 1790

Gly Asp Lys Lys Thr Leu Thr Arg Lys Lys Val Asn Gln Phe Phe Lys  
 1795 1800 1805

Thr Met Leu Ala Ser Lys Ser Ala Glu Glu Gly Lys Gln Ile Pro Asp  
 1810 1815 1820

Ser Leu Ser Thr Asp Leu  
 1825 1830

<210> 3

<211> 727

<212> PRT

<213> Mus musculus

<400> 3

Met Pro Pro Pro Ser Asp Ile Val Lys Val Ala Ile Glu Trp Pro Gly  
 1 5 10 15

Ala Tyr Pro Lys Leu Met Glu Ile Asp Gln Lys Lys Pro Leu Ser Ala  
 20 25 30

Ile Ile Lys Glu Val Cys Asp Gly Trp Ser Leu Ala Asn His Glu Tyr  
 35 40 45

Phe Ala Leu Gln His Ala Asp Ser Ser Asn Phe Tyr Ile Thr Glu Lys  
 50 55 60

Asn	Arg	Asn	Glu	Ile	Lys	Asn	Gly	Thr	Ile	Leu	Arg	Leu	Thr	Thr	Ser	65	70	75	80
Pro	Ala	Gln	Asn	Ala	Gln	Gln	Leu	His	Glu	Arg	Ile	Gln	Ser	Ser	Ser	85	90	95	
Met	Asp	Ala	Lys	Leu	Glu	Ala	Leu	Lys	Asp	Leu	Ala	Ser	Leu	Ser	Arg	100	105	110	
Asp	Val	Thr	Phe	Ala	Gln	Glu	Phe	Ile	Asn	Leu	Asp	Gly	Ile	Ser	Leu	115	120	125	
Leu	Thr	Gln	Met	Val	Glu	Ser	Gly	Thr	Glu	Arg	Tyr	Gln	Lys	Leu	Gln	130	135	140	
Lys	Ile	Met	Lys	Pro	Cys	Phe	Gly	Asp	Met	Leu	Ser	Phe	Thr	Leu	Thr	145	150	155	160
Ala	Phe	Val	Glu	Leu	Met	Asp	His	Gly	Ile	Val	Ser	Trp	Asp	Thr	Phe	165	170	175	
Ser	Val	Ala	Phe	Ile	Lys	Lys	Ile	Ala	Ser	Phe	Val	Asn	Lys	Ser	Ala	180	185	190	
Ile	Asp	Ile	Ser	Ile	Leu	Gln	Arg	Ser	Leu	Ala	Ile	Leu	Glu	Ser	Met	195	200	205	
Val	Leu	Asn	Ser	His	Asp	Leu	Tyr	Gln	Lys	Val	Ala	Gln	Glu	Ile	Thr	210	215	220	
Ile	Gly	Gln	Leu	Ile	Pro	His	Leu	Gln	Gly	Thr	Asp	Gln	Glu	Ile	Gln	225	230	235	240
Thr	Tyr	Thr	Ile	Ala	Val	Ile	Asn	Ala	Leu	Phe	Leu	Lys	Ala	Pro	Asp	245	250	255	
Glu	Arg	Arg	Gln	Glu	Met	Ala	Asn	Ile	Leu	Ala	Gln	Lys	Gln	Leu	Arg	260	265	270	
Tyr	Ile	Ile	Leu	Thr	His	Val	Ile	Arg	Ala	Gln	Arg	Ala	Ile	Asn	Asn	275	280	285	
Glu	Met	Ala	His	Gln	Leu	Tyr	Val	Leu	Gln	Val	Leu	Thr	Phe	Asn	Leu	290	295	300	
Leu	Glu	Asp	Arg	Met	Met	Thr	Lys	Met	Asp	Pro	Gln	Asp	Gln	Ala	Gln	305	310	315	320
Arg	Asp	Ile	Ile	Phe	Glu	Leu	Arg	Arg	Ile	Ala	Phe	Asp	Ala	Glu	Ser	325	330	335	
Glu	Pro	Asn	Asn	Ser	Ser	Gly	Ser	Met	Glu	Lys	Arg	Lys	Ser	Met	Tyr	340	345	350	
Thr	Arg	Asp	Tyr	Lys	Lys	Leu	Gly	Phe	Ile	Asn	His	Val	Asn	Pro	Ala	355	360	365	

Met Asp Phe Thr Gln Thr Pro Pro Gly Met Leu Ala Leu Asp Asn Met  
 370 375 380  
 Leu Tyr Phe Ala Lys His His Gln Asp Ala Tyr Ile Arg Ile Val Leu  
 385 390 395 400  
 Glu Asn Ser Ser Arg Glu Asp Lys His Glu Cys Pro Phe Gly Arg Ser  
 405 410 415  
 Ser Ile Glu Leu Thr Lys Met Leu Cys Glu Ile Leu Lys Val Gly Glu  
 420 425 430  
 Leu Pro Ser Glu Thr Cys Asn Asp Phe His Pro Met Phe Phe Thr His  
 435 440 445  
 Asp Arg Ser Phe Glu Glu Phe Phe Cys Ile Cys Ile Gln Leu Leu Asn  
 450 455 460  
 Lys Thr Trp Lys Glu Met Arg Ala Thr Ser Glu Asp Phe Asn Lys Val  
 465 470 475 480  
 Met Gln Val Val Lys Glu Gln Val Met Arg Ala Leu Thr Thr Lys Pro  
 485 490 495  
 Ser Ser Leu Asp Gln Phe Lys Ser Lys Leu Gln Asn Leu Ser Tyr Thr  
 500 505 510  
 Glu Ile Leu Lys Ile Arg Gln Ser Glu Arg Met Asn Gln Glu Asp Phe  
 515 520 525  
 Gln Ser Arg Pro Ile Leu Glu Leu Lys Glu Lys Ile Gln Pro Glu Ile  
 530 535 540  
 Leu Glu Leu Ile Lys Gln Gln Arg Leu Asn Arg Leu Val Glu Gly Thr  
 545 550 555 560  
 Cys Phe Arg Lys Leu Asn Ala Arg Arg Arg Gln Asp Lys Phe Trp Tyr  
 565 570 575  
 Cys Arg Leu Ser Pro Asn His Lys Val Leu His Tyr Gly Asp Leu Glu  
 580 585 590  
 Glu Ser Pro Gln Gly Glu Val Pro His Asp Ser Leu Gln Asp Lys Leu  
 595 600 605  
 Pro Val Ala Asp Ile Lys Ala Val Val Thr Gly Lys Asp Cys Pro His  
 610 615 620  
 Met Lys Glu Lys Gly Ala Leu Lys Gln Asn Lys Glu Val Leu Glu Leu  
 625 630 635 640  
 Ala Phe Ser Ile Leu Tyr Asp Ser Asn Cys Gln Leu Asn Phe Ile Ala  
 645 650 655  
 Pro Asp Lys His Glu Tyr Cys Ile Trp Thr Asp Gly Leu Asn Ala Leu  
 660 665 670

Leu Gly Lys Asp Met Met Ser Asp Leu Thr Arg Asn Asp Leu Asp Thr  
 675 680 685

Leu Leu Ser Met Glu Ile Lys Leu Arg Leu Leu Asp Leu Glu Asn Ile  
 690 695 700

Gln Ile Pro Asp Ala Pro Pro Pro Ile Pro Lys Glu Pro Ser Asn Tyr  
 705 710 715 720

Asp Phe Val Tyr Asp Cys Asn  
 725

<210> 4

<211> 727

<212> PRT

<213> Homo sapiens

<400> 4

Met Pro Pro Pro Ala Asp Ile Val Lys Val Ala Ile Glu Trp Pro Gly  
 1 5 10 15

Ala Tyr Pro Lys Leu Met Glu Ile Asp Gln Lys Lys Pro Leu Ser Ala  
 20 25 30

Ile Ile Lys Glu Val Cys Asp Gly Trp Ser Leu Ala Asn His Glu Tyr  
 35 40 45

Phe Ala Leu Gln His Ala Asp Ser Ser Asn Phe Tyr Ile Thr Glu Lys  
 50 55 60

Asn Arg Asn Glu Ile Lys Asn Gly Thr Ile Leu Arg Leu Thr Thr Ser  
 65 70 75 80

Pro Ala Gln Asn Ala Gln Gln Leu His Glu Arg Ile Gln Ser Ser Ser  
 85 90 95

Met Asp Ala Lys Leu Glu Ala Leu Lys Asp Leu Ala Ser Leu Ser Arg  
 100 105 110

Asp Val Thr Phe Ala Gln Glu Phe Ile Asn Leu Asp Gly Ile Ser Leu  
 115 120 125

Leu Thr Gln Met Val Glu Ser Gly Thr Glu Arg Tyr Gln Lys Leu Gln  
 130 135 140

Lys Ile Met Lys Pro Cys Phe Gly Asp Met Leu Ser Phe Thr Leu Thr  
 145 150 155 160

Ala Phe Val Glu Leu Met Asp His Gly Ile Val Ser Trp Asp Thr Phe  
 165 170 175

Ser Val Ala Phe Ile Lys Lys Ile Ala Ser Phe Val Asn Lys Ser Ala  
 180 185 190

Ile Asp Ile Ser Ile Leu Gln Arg Ser Leu Ala Ile Leu Glu Ser Met  
 195 200 205

Val	Leu	Asn	Ser	His	Asp	Leu	Tyr	Gln	Lys	Val	Ala	Gln	Glu	Ile	Thr	210	215	220	
Ile	Gly	Gln	Leu	Ile	Pro	His	Leu	Gln	Gly	Ser	Asp	Gln	Glu	Ile	Gln	225	230	235	240
Thr	Tyr	Thr	Ile	Ala	Val	Ile	Asn	Ala	Leu	Phe	Leu	Lys	Ala	Pro	Asp	245	250	255	
Glu	Arg	Arg	Gln	Glu	Met	Ala	Asn	Ile	Leu	Ala	Gln	Lys	Gln	Leu	Arg	260	265	270	
Ser	Ile	Ile	Leu	Thr	His	Val	Ile	Arg	Ala	Gln	Arg	Ala	Ile	Asn	Asn	275	280	285	
Glu	Met	Ala	His	Gln	Leu	Tyr	Val	Leu	Gln	Val	Leu	Thr	Phe	Asn	Leu	290	295	300	
Leu	Glu	Asp	Arg	Met	Met	Thr	Lys	Met	Asp	Pro	Gln	Asp	Gln	Ala	Gln	305	310	315	320
Arg	Asp	Ile	Ile	Phe	Glu	Leu	Arg	Arg	Ile	Ala	Phe	Asp	Ala	Glu	Ser	325	330	335	
Glu	Pro	Asn	Asn	Ser	Ser	Gly	Ser	Met	Glu	Lys	Arg	Lys	Ser	Met	Tyr	340	345	350	
Thr	Arg	Asp	Tyr	Lys	Lys	Leu	Gly	Phe	Ile	Asn	His	Val	Asn	Pro	Ala	355	360	365	
Met	Asp	Phe	Thr	Gln	Thr	Pro	Pro	Gly	Met	Leu	Ala	Leu	Asp	Asn	Met	370	375	380	
Leu	Tyr	Phe	Ala	Lys	His	His	Gln	Asp	Ala	Tyr	Ile	Arg	Ile	Val	Leu	385	390	395	400
Glu	Asn	Ser	Ser	Arg	Glu	Asp	Lys	His	Glu	Cys	Pro	Phe	Gly	Arg	Ser	405	410	415	
Ser	Ile	Glu	Leu	Thr	Lys	Met	Leu	Cys	Glu	Ile	Leu	Lys	Val	Gly	Glu	420	425	430	
Leu	Pro	Ser	Glu	Thr	Cys	Asn	Asp	Phe	His	Pro	Met	Phe	Phe	Thr	His	435	440	445	
Asp	Arg	Ser	Phe	Glu	Glu	Phe	Phe	Cys	Ile	Cys	Ile	Gln	Leu	Leu	Asn	450	455	460	
Lys	Thr	Trp	Lys	Glu	Met	Arg	Ala	Thr	Ser	Glu	Asp	Phe	Asn	Lys	Val	465	470	475	480
Met	Gln	Val	Val	Lys	Glu	Gln	Val	Met	Arg	Ala	Leu	Thr	Thr	Lys	Pro	485	490	495	
Ser	Ser	Leu	Asp	Gln	Phe	Lys	Ser	Lys	Leu	Gln	Asn	Leu	Ser	Tyr	Thr	500	505	510	

Glu Ile Leu Lys Ile Arg Gln Ser Glu Arg Met Asn Gln Glu Asp Phe  
515 520 525

Gln Ser Arg Pro Ile Leu Glu Leu Lys Glu Lys Ile Gln Pro Glu Ile  
530 535 540

Leu Glu Leu Ile Lys Gln Gln Arg Leu Asn Arg Leu Val Glu Gly Thr  
545 550 555 560

Cys Phe Arg Lys Leu Asn Ala Arg Arg Arg Gln Asp Lys Phe Trp Tyr  
565 570 575

Cys Arg Leu Ser Pro Asn His Lys Val Leu His Tyr Gly Asp Leu Glu  
580 585 590

Glu Ser Pro Gln Gly Glu Val Pro His Asp Ser Leu Gln Asp Lys Leu  
595 600 605

Pro Val Ala Asp Ile Lys Ala Val Val Thr Gly Lys Asp Cys Pro His  
610 615 620

Met Lys Glu Lys Gly Ala Leu Lys Gln Asn Lys Glu Val Leu Glu Leu  
625 630 635 640

Ala Phe Ser Ile Leu Tyr Asp Ser Asn Cys Gln Leu Asn Phe Ile Ala  
645 650 655

Pro Asp Lys His Glu Tyr Cys Ile Trp Thr Asp Gly Leu Asn Ala Leu  
660 665 670

Leu Gly Lys Asp Met Met Ser Asp Leu Thr Arg Asn Asp Leu Asp Thr  
675 680 685

Leu Leu Ser Met Glu Ile Lys Leu Arg Leu Leu Asp Leu Glu Asn Ile  
690 695 700

Gln Ile Pro Asp Ala Pro Pro Pro Ile Pro Lys Glu Pro Ser Asn Tyr  
705 710 715 720

Asp Phe Val Tyr Asp Cys Asn  
725

<210> 5

<211> 1591

<212> PRT

<213> Mus musculus

<400> 5

Met Gly Asn Ala Glu Ser Gln Asn Val Asp His Glu Phe Tyr Gly Glu  
1 5 10 15

Lys His Ala Ser Leu Gly Arg Lys His Thr Ser Arg Ser Leu Arg Leu  
20 25 30

Ser His Lys Thr Arg Arg Thr Arg His Ala Ser Ser Gly Lys Ala Ile  
35 40 45

His	Arg	Asn	Ser	Glu	Val	Ser	Thr	Arg	Ser	Ser	Ser	Thr	Pro	Ser	Ile
	50						55					60			
Pro	Gln	Ser	Leu	Ala	Glu	Asn	Gly	Leu	Glu	Pro	Phe	Ser	Gln	Glu	Gly
	65				70					75					80
Ala	Leu	Asp	Asp	Phe	Gly	Asp	Pro	Ile	Trp	Val	Asp	Arg	Val	Asp	Met
				85					90					95	
Gly	Leu	Arg	Pro	Val	Ser	Tyr	Thr	Asp	Ser	Ser	Val	Thr	Pro	Ser	Val
			100					105					110		
Asp	Gly	Ser	Ile	Val	Leu	Thr	Ala	Ala	Ser	Val	Gln	Ser	Met	Pro	Asp
		115					120					125			
Ser	Glu	Glu	Ser	Arg	Leu	Tyr	Gly	Asp	Asp	Ala	Thr	Tyr	Leu	Ala	Glu
	130					135					140				
Gly	Gly	Arg	Arg	Gln	Cys	Pro	Tyr	Thr	Ser	Asn	Gly	Pro	Thr	Phe	Met
	145				150					155					160
Glu	Thr	Ala	Ser	Phe	Lys	Lys	Lys	Arg	Ser	Lys	Ser	Ala	Asp	Ile	Trp
				165					170					175	
Arg	Glu	Asp	Ser	Leu	Glu	Phe	Ser	Leu	Ser	Asp	Leu	Ser	Gln	Glu	His
			180					185					190		
Leu	Thr	Ser	Asn	Glu	Glu	Ile	Leu	Gly	Ser	Ala	Glu	Glu	Lys	Asp	Cys
		195					200					205			
Glu	Glu	Ala	Arg	Gly	Met	Glu	Thr	Glu	Ala	Ser	Pro	Arg	Gln	Leu	Ser
	210					215					220				
Thr	Cys	Gln	Arg	Ala	Asn	Ser	Leu	Gly	Asp	Leu	Tyr	Ala	Gln	Lys	Asn
	225				230					235					240
Ser	Gly	Val	Lys	Ala	Asn	Gly	Gly	Pro	Arg	Asn	Arg	Phe	Ser	Ser	Tyr
				245					250					255	
Cys	Arg	Asn	Leu	Val	Ser	Asp	Ile	Pro	Asp	Leu	Ala	Lys	His	Lys	Met
			260					265					270		
Pro	Pro	Ala	Ala	Ala	Glu	Glu	Thr	Pro	Pro	Tyr	Ser	Asn	Tyr	Asn	Thr
		275					280					285			
Leu	Pro	Cys	Arg	Lys	Ser	His	Cys	Leu	Ser	Glu	Gly	Ala	Thr	Asn	Pro
	290					295					300				
Gln	Ile	Ser	Leu	Ser	Lys	Ser	Met	Gln	Gly	Arg	Arg	Ala	Lys	Thr	Thr
	305				310					315					320
Gln	Asp	Val	Asn	Thr	Gly	Glu	Gly	Ser	Glu	Phe	Ala	Asp	Ser	Gly	Ile
				325					330					335	
Glu	Gly	Ala	Thr	Thr	Asp	Thr	Asp	Leu	Leu	Ser	Arg	Arg	Ser	Asn	Ala
			340					345						350	

Thr	Asn	Ser	Ser	Tyr	Ser	Pro	Pro	Thr	Gly	Arg	Ala	Phe	Val	Gly	Ser
355						360						365			
Asp	Ser	Gly	Ser	Ser	Ser	Thr	Gly	Asp	Arg	Ala	Arg	Gln	Gly	Val	Tyr
370						375						380			
Glu	Asn	Phe	Arg	Arg	Glu	Leu	Glu	Met	Ser	Thr	Thr	Asn	Ser	Glu	Ser
385						390						395		400	
Leu	Glu	Glu	Ala	Gly	Ser	Ala	His	Ser	Asp	Glu	Gln	Ser	Ser	Gly	Thr
				405										415	
Leu	Ser	Ser	Pro	Gly	Gln	Ser	Asp	Ile	Leu	Leu	Thr	Ala	Ala	Gln	Gly
				420				425						430	
Thr	Val	Arg	Lys	Ala	Gly	Ala	Leu	Ala	Val	Lys	Asn	Phe	Leu	Val	His
		435						440				445			
Lys	Lys	Asn	Lys	Lys	Val	Glu	Ser	Ala	Thr	Arg	Arg	Lys	Trp	Lys	His
450						455						460			
Tyr	Trp	Val	Ser	Leu	Lys	Gly	Cys	Thr	Leu	Phe	Phe	Tyr	Glu	Thr	Asp
465						470				475				480	
Gly	Arg	Ser	Gly	Ile	Asp	His	Asn	Ser	Val	Pro	Lys	His	Ala	Val	Trp
				485						490				495	
Val	Glu	Asn	Ser	Ile	Val	Gln	Ala	Val	Pro	Glu	His	Pro	Lys	Lys	Asp
		500						505						510	
Phe	Val	Phe	Cys	Leu	Ser	Asn	Ser	Leu	Gly	Asp	Ala	Phe	Leu	Phe	Gln
		515						520				525			
Thr	Thr	Ser	Gln	Thr	Glu	Leu	Glu	Asn	Trp	Ile	Thr	Ala	Ile	His	Ser
530						535						540			
Ala	Cys	Ala	Ala	Ala	Val	Ala	Arg	His	His	His	Lys	Glu	Asp	Thr	Leu
545						550				555				560	
Arg	Leu	Leu	Lys	Ser	Glu	Ile	Lys	Lys	Leu	Glu	Gln	Lys	Ile	Asp	Met
				565						570				575	
Asp	Glu	Lys	Met	Lys	Lys	Met	Gly	Glu	Met	Gln	Leu	Ser	Ser	Val	Thr
		580						585				590			
Asp	Ser	Lys	Lys	Lys	Lys	Thr	Ile	Leu	Asp	Gln	Ile	Phe	Val	Trp	Glu
		595				600						605			
Gln	Asn	Leu	Glu	Gln	Phe	Gln	Met	Asp	Leu	Phe	Arg	Phe	Arg	Cys	Tyr
610						615						620			
Leu	Ala	Ser	Leu	Gln	Gly	Gly	Glu	Leu	Pro	Asn	Pro	Lys	Arg	Leu	Leu
625						630				635				640	
Ala	Phe	Ala	Ser	Arg	Pro	Thr	Lys	Val	Ala	Met	Gly	Arg	Leu	Gly	Ile
				645						650				655	

Phe	Ser	Val	Ser	Ser	Phe	His	Ala	Leu	Val	Ala	Ala	Arg	Thr	Gly	Glu	
			660					665						670		
Ile	Gly	Val	Arg	Arg	Arg	Thr	Gln	Ala	Met	Ser	Arg	Ser	Ala	Ser	Lys	
		675					680					685				
Arg	Arg	Ser	Arg	Phe	Ser	Ser	Leu	Trp	Gly	Leu	Asp	Thr	Thr	Ser	Lys	
		690				695					700					
Lys	Lys	Gln	Gly	Arg	Pro	Thr	Ile	Asn	Gln	Val	Phe	Gly	Glu	Gly	Thr	
705					710					715					720	
Asp	Ala	Val	Lys	Arg	Ser	Leu	Glu	Gly	Ile	Phe	Asp	Asp	Thr	Val	Pro	
				725					730					735		
Asp	Gly	Lys	Arg	Glu	Lys	Glu	Val	Val	Leu	Pro	Ser	Val	His	Gln	His	
			740					745					750			
Asn	Pro	Asp	Cys	Asp	Ile	Trp	Val	His	Glu	Tyr	Phe	Thr	Pro	Ser	Trp	
		755					760					765				
Phe	Cys	Leu	Pro	Asn	Asn	Gln	Pro	Ala	Leu	Thr	Val	Val	Arg	Pro	Gly	
		770				775					780					
Asp	Thr	Ala	Arg	Asp	Thr	Leu	Glu	Leu	Ile	Cys	Lys	Thr	His	Gln	Leu	
785					790					795					800	
Asp	His	Ser	Ala	His	Tyr	Leu	Arg	Leu	Lys	Phe	Leu	Met	Glu	Asn	Arg	
				805					810					815		
Val	Gln	Phe	Tyr	Ile	Pro	Gln	Pro	Glu	Glu	Asp	Ile	Tyr	Glu	Leu	Leu	
			820					825					830			
Tyr	Lys	Glu	Ile	Glu	Ile	Cys	Pro	Lys	Val	Thr	Gln	Asn	Ile	His	Ile	
		835					840					845				
Glu	Lys	Ser	Asp	Ala	Ala	Ala	Asp	Asn	Tyr	Gly	Phe	Leu	Leu	Ser	Ser	
		850				855					860					
Val	Asp	Glu	Asp	Gly	Ile	Arg	Arg	Leu	Tyr	Val	Asn	Ser	Val	Lys	Glu	
865					870					875					880	
Thr	Gly	Leu	Ala	Ser	Lys	Lys	Gly	Leu	Lys	Ala	Gly	Asp	Glu	Ile	Leu	
				885					890					895		
Glu	Ile	Asn	Asn	Arg	Ala	Ala	Gly	Thr	Leu	Asn	Ser	Ser	Met	Leu	Lys	
			900					905					910			
Asp	Phe	Leu	Ser	Gln	Pro	Ser	Leu	Gly	Leu	Leu	Val	Arg	Thr	Tyr	Pro	
		915					920					925				
Glu	Pro	Glu	Gly	Gly	Val	Glu	Leu	Leu	Glu	Asn	Pro	Pro	His	Arg	Val	
		930				935					940					
Asp	Gly	Pro	Val	Asp	Leu	Gly	Glu	Ser	Pro	Leu	Ala	Phe	Leu	Thr	Ser	
945					950					955					960	

Asn	Pro	Gly	His	Ser	Leu	Ser	Ser	Glu	Gln	Gly	Ser	Ser	Ala	Glu	Thr	965	970	975	
Ala	Pro	Glu	Glu	Gly	Glu	Gly	Pro	Asp	Leu	Glu	Ser	Ser	Asp	Glu	Thr	980	985	990	
Asp	His	Ser	Ser	Lys	Ser	Thr	Glu	Gln	Val	Ala	Ala	Phe	Cys	Arg	Ser	995	1000	1005	
Leu	His	Glu	Met	Ser	Pro	Ser	Asp	Ser	Ser	Pro	Ser	Pro	Gln	Asp	Ala	1010	1015	1020	
Thr	Ser	Pro	Gln	Leu	Ala	Thr	Thr	Arg	Gln	Leu	Ser	Asp	Ala	Asp	Lys	1025	1030	1035	1040
Leu	Arg	Lys	Val	Ile	Cys	Glu	Leu	Leu	Glu	Thr	Glu	Arg	Thr	Tyr	Val	1045	1050	1055	
Lys	Asp	Leu	Asn	Cys	Leu	Met	Glu	Arg	Tyr	Leu	Lys	Pro	Leu	Gln	Lys	1060	1065	1070	
Glu	Thr	Phe	Leu	Thr	Gln	Asp	Glu	Leu	Asp	Val	Leu	Phe	Gly	Asn	Leu	1075	1080	1085	
Thr	Glu	Met	Val	Glu	Phe	Gln	Val	Glu	Phe	Leu	Lys	Thr	Leu	Glu	Asp	1090	1095	1100	
Gly	Val	Arg	Leu	Val	Pro	Asp	Leu	Glu	Lys	Leu	Glu	Lys	Val	Asp	Gln	1105	1110	1115	1120
Phe	Lys	Lys	Val	Leu	Phe	Ser	Leu	Gly	Gly	Ser	Phe	Leu	Tyr	Tyr	Ala	1125	1130	1135	
Asp	Arg	Phe	Lys	Leu	Tyr	Ser	Ala	Phe	Cys	Ala	Ser	His	Thr	Lys	Val	1140	1145	1150	
Pro	Lys	Val	Leu	Val	Lys	Ala	Lys	Thr	Asp	Thr	Ala	Phe	Lys	Ala	Phe	1155	1160	1165	
Leu	Asp	Ala	Gln	Asn	Pro	Arg	Gln	Gln	His	Ser	Ser	Thr	Leu	Glu	Ser	1170	1175	1180	
Tyr	Leu	Ile	Lys	Pro	Ile	Gln	Arg	Val	Leu	Lys	Tyr	Pro	Leu	Leu	Leu	1185	1190	1195	1200
Arg	Glu	Leu	Phe	Ala	Leu	Thr	Asp	Ala	Glu	Ser	Glu	Glu	His	Tyr	His	1205	1210	1215	
Leu	Asp	Val	Ala	Ile	Lys	Thr	Met	Asn	Lys	Val	Ala	Ser	His	Ile	Asn	1220	1225	1230	
Glu	Met	Gln	Lys	Ile	His	Glu	Glu	Phe	Gly	Ala	Val	Phe	Asp	Gln	Leu	1235	1240	1245	
Ile	Ala	Glu	Gln	Thr	Gly	Glu	Lys	Lys	Glu	Val	Ala	Asp	Leu	Ser	Met	1250	1255	1260	

Gly Asp Leu Leu Leu His Thr Ser Val Ile Trp Leu Asn Pro Pro Ala  
 1265 1270 1275 1280  
 Ser Leu Gly Lys Trp Lys Lys Glu Pro Glu Leu Ala Ala Phe Val Phe  
 1285 1290 1295  
 Lys Thr Ala Val Val Leu Val Tyr Lys Asp Gly Ser Lys Gln Lys Lys  
 1300 1305 1310  
 Lys Leu Val Gly Ser His Arg Leu Ser Ile Tyr Glu Glu Trp Asp Pro  
 1315 1320 1325  
 Phe Arg Phe Arg His Met Ile Pro Thr Glu Ala Leu Gln Val Arg Ala  
 1330 1335 1340  
 Leu Pro Ser Ala Asp Ala Glu Ala Asn Ala Val Cys Glu Ile Val His  
 1345 1350 1355 1360  
 Val Lys Ser Glu Ser Glu Gly Arg Pro Glu Arg Val Phe His Leu Cys  
 1365 1370 1375  
 Cys Ser Ser Pro Glu Ser Arg Lys Asp Phe Leu Lys Ser Val His Ser  
 1380 1385 1390  
 Ile Leu Arg Asp Lys His Arg Arg Gln Leu Leu Lys Thr Glu Ser Leu  
 1395 1400 1405  
 Pro Ser Ala Gln Gln Tyr Val Pro Phe Gly Gly Lys Arg Leu Cys Ala  
 1410 1415 1420  
 Leu Lys Gly Ala Arg Pro Ala Met Ser Arg Ala Val Ser Ala Pro Ser  
 1425 1430 1435 1440  
 Lys Ser Leu Gly Arg Arg Arg Arg Arg Leu Ala Arg Asn Arg Phe Thr  
 1445 1450 1455  
 Ile Asp Ser Asp Ala Ile Ser Ala Ser Ser Pro Glu Lys Glu Pro Gln  
 1460 1465 1470  
 Gln Pro Ala Gly Gly Gly Asp Thr Asp Arg Trp Val Glu Glu Gln Phe  
 1475 1480 1485  
 Asp Leu Ala Gln Tyr Glu Glu Gln Asp Asp Ile Lys Glu Thr Asp Ile  
 1490 1495 1500  
 Leu Ser Asp Asp Asp Glu Phe Cys Glu Ser Leu Lys Gly Ala Ser Val  
 1505 1510 1515 1520  
 Asp Arg Asp Leu Gln Glu Gln Leu Gln Ala Ala Ser Ile Ser Gln Arg  
 1525 1530 1535  
 Ala Arg Gly Arg Arg Thr Leu Asp Ser His Ala Ser Arg Met Thr Gln  
 1540 1545 1550  
 Leu Lys Lys Gln Ala Ala Leu Ser Gly Ile Asn Gly Gly Leu Glu Ser  
 1555 1560 1565

Ala Ser Glu Glu Val Ile Trp Val Arg Arg Glu Asp Phe Ala Pro Ser  
 1570 1575 1580

Arg Lys Leu Asn Thr Glu Ile  
 1585 1590

<210> 6

<211> 1591

<212> PRT

<213> Homo sapiens

<400> 6

Met Gly Asn Ala Glu Ser Gln His Val Glu His Glu Phe Tyr Gly Glu  
 1 5 10 15

Lys His Ala Ser Leu Gly Arg Asn Asp Thr Ser Arg Ser Leu Arg Leu  
 20 25 30

Ser His Lys Thr Arg Arg Thr Arg His Ala Ser Ser Gly Lys Val Ile  
 35 40 45

His Arg Asn Ser Glu Val Ser Thr Arg Ser Ser Ser Thr Pro Ser Ile  
 50 55 60

Pro Gln Ser Leu Ala Glu Asn Gly Leu Glu Pro Phe Ser Gln Asp Gly  
 65 70 75 80

Thr Leu Glu Asp Phe Gly Ser Pro Ile Trp Val Asp Arg Val Asp Met  
 85 90 95

Gly Leu Arg Pro Val Ser Tyr Thr Asp Ser Ser Val Thr Pro Ser Val  
 100 105 110

Asp Ser Ser Ile Val Leu Thr Ala Ala Ser Val Gln Ser Met Pro Asp  
 115 120 125

Thr Glu Glu Ser Arg Leu Tyr Gly Asp Asp Ala Thr Tyr Leu Ala Glu  
 130 135 140

Gly Gly Arg Arg Gln His Ser Tyr Thr Ser Asn Gly Pro Thr Phe Met  
 145 150 155 160

Glu Thr Ala Ser Phe Lys Lys Lys Arg Ser Lys Ser Ala Asp Ile Trp  
 165 170 175

Arg Glu Asp Ser Leu Glu Phe Ser Leu Ser Asp Leu Ser Gln Glu His  
 180 185 190

Leu Thr Ser Asn Glu Glu Ile Leu Gly Ser Ala Glu Glu Lys Asp Cys  
 195 200 205

Glu Glu Ala Arg Gly Met Glu Thr Arg Ala Ser Pro Arg Gln Leu Ser  
 210 215 220

Thr Cys Gln Arg Ala Asn Ser Leu Gly Asp Leu Tyr Ala Gln Lys Asn  
 225 230 235 240

Ser	Gly	Val	Thr	Ala	Asn	Met	Gly	Pro	Gly	Ser	Lys	Phe	Ala	Gly	Tyr		245	250	255
Cys	Arg	Asn	Leu	Val	Ser	Asp	Ile	Pro	Asn	Leu	Ala	Asn	His	Lys	Met		260	265	270
Pro	Pro	Ala	Ala	Ala	Glu	Glu	Thr	Pro	Pro	Tyr	Ser	Asn	Tyr	Asn	Thr		275	280	285
Leu	Pro	Cys	Arg	Lys	Ser	His	Cys	Leu	Ser	Glu	Gly	Ala	Thr	Asn	Pro		290	295	300
Gln	Ile	Ser	His	Ser	Asn	Ser	Met	Gln	Gly	Arg	Arg	Ala	Lys	Thr	Thr		305	310	315
Gln	Asp	Val	Asn	Ala	Gly	Glu	Gly	Ser	Glu	Phe	Ala	Asp	Ser	Gly	Ile		325	330	335
Glu	Gly	Ala	Thr	Thr	Asp	Thr	Asp	Leu	Leu	Ser	Arg	Arg	Ser	Asn	Ala		340	345	350
Thr	Asn	Ser	Ser	Tyr	Ser	Pro	Thr	Thr	Gly	Arg	Ala	Phe	Val	Gly	Ser		355	360	365
Asp	Ser	Gly	Ser	Ser	Ser	Thr	Gly	Asp	Ala	Ala	Arg	Gln	Gly	Val	Tyr		370	375	380
Glu	Asn	Phe	Arg	Arg	Glu	Leu	Glu	Met	Ser	Thr	Thr	Asn	Ser	Glu	Ser		385	390	395
Leu	Glu	Glu	Ala	Gly	Ser	Ala	His	Ser	Asp	Glu	Gln	Ser	Ser	Gly	Thr		405	410	415
Leu	Ser	Ser	Pro	Gly	Gln	Ser	Asp	Ile	Leu	Leu	Thr	Ala	Ala	Gln	Gly		420	425	430
Thr	Val	Arg	Lys	Ala	Gly	Ala	Leu	Ala	Val	Lys	Asn	Phe	Leu	Val	His		435	440	445
Lys	Lys	Asn	Lys	Lys	Val	Glu	Ser	Ala	Thr	Arg	Arg	Lys	Trp	Lys	His		450	455	460
Tyr	Trp	Val	Ser	Leu	Lys	Gly	Cys	Thr	Leu	Phe	Phe	Tyr	Glu	Ser	Asp		465	470	475
Gly	Arg	Ser	Gly	Ile	Asp	His	Asn	Ser	Ile	Pro	Lys	His	Ala	Val	Trp		485	490	495
Val	Glu	Asn	Ser	Ile	Val	Gln	Ala	Val	Pro	Glu	His	Pro	Lys	Lys	Asp		500	505	510
Phe	Val	Phe	Cys	Leu	Ser	Asn	Ser	Leu	Gly	Asp	Ala	Phe	Leu	Phe	Gln		515	520	525
Thr	Thr	Ser	Gln	Thr	Glu	Leu	Glu	Asn	Trp	Ile	Thr	Ala	Ile	His	Ser		530	535	540

Ala	Cys	Ala	Thr	Ala	Val	Ala	Arg	His	His	His	Lys	Glu	Asp	Thr	Leu	545	550	555	560
Arg	Leu	Leu	Lys	Ser	Glu	Ile	Lys	Lys	Leu	Glu	Gln	Lys	Ile	Asp	Met	565	570	575	
Asp	Glu	Lys	Met	Lys	Lys	Met	Gly	Glu	Met	Gln	Leu	Ser	Ser	Val	Thr	580	585	590	
Asp	Ser	Lys	Lys	Lys	Lys	Thr	Ile	Leu	Asp	Gln	Ile	Phe	Val	Trp	Glu	595	600	605	
Gln	Asn	Leu	Glu	Gln	Phe	Gln	Met	Asp	Leu	Phe	Arg	Phe	Arg	Cys	Tyr	610	615	620	
Leu	Ala	Ser	Leu	Gln	Gly	Gly	Glu	Leu	Pro	Asn	Pro	Lys	Arg	Leu	Leu	625	630	635	640
Ala	Phe	Ala	Ser	Arg	Pro	Thr	Lys	Val	Ala	Met	Gly	Arg	Leu	Gly	Ile	645	650	655	
Phe	Ser	Val	Ser	Ser	Phe	His	Ala	Leu	Val	Ala	Ala	Arg	Thr	Gly	Glu	660	665	670	
Thr	Gly	Val	Arg	Arg	Arg	Thr	Gln	Ala	Met	Ser	Arg	Ser	Ala	Ser	Lys	675	680	685	
Arg	Arg	Ser	Arg	Phe	Ser	Ser	Leu	Trp	Gly	Leu	Asp	Thr	Thr	Ser	Lys	690	695	700	
Lys	Lys	Gln	Gly	Arg	Pro	Ser	Ile	Asn	Gln	Val	Phe	Gly	Glu	Gly	Thr	705	710	715	720
Glu	Ala	Val	Lys	Lys	Ser	Leu	Glu	Gly	Ile	Phe	Asp	Asp	Ile	Val	Pro	725	730	735	
Asp	Gly	Lys	Arg	Glu	Lys	Glu	Val	Val	Leu	Pro	Asn	Val	His	Gln	His	740	745	750	
Asn	Pro	Asp	Cys	Asp	Ile	Trp	Val	His	Glu	Tyr	Phe	Thr	Pro	Ser	Trp	755	760	765	
Phe	Cys	Leu	Pro	Asn	Asn	Gln	Pro	Ala	Leu	Thr	Val	Val	Arg	Pro	Gly	770	775	780	
Asp	Thr	Ala	Arg	Asp	Thr	Leu	Glu	Leu	Ile	Cys	Lys	Thr	His	Gln	Leu	785	790	795	800
Asp	His	Ser	Ala	His	Tyr	Leu	Arg	Leu	Lys	Phe	Leu	Ile	Glu	Asn	Lys	805	810	815	
Met	Gln	Leu	Tyr	Val	Pro	Gln	Pro	Glu	Glu	Asp	Ile	Tyr	Glu	Leu	Leu	820	825	830	
Tyr	Lys	Glu	Ile	Glu	Ile	Cys	Pro	Lys	Val	Thr	His	Ser	Ile	His	Ile	835	840	845	

Glu Lys Ser Asp Thr Ala Ala Asp Thr Tyr Gly Phe Ser Leu Ser Ser  
 850 855 860  
 Val Glu Glu Asp Gly Ile Arg Arg Leu Tyr Val Asn Ser Val Lys Glu  
 865 870 875 880  
 Thr Gly Leu Ala Ser Lys Lys Gly Leu Lys Ala Gly Asp Glu Ile Leu  
 885 890 895  
 Glu Ile Asn Asn Arg Ala Ala Asp Ala Leu Asn Ser Ser Met Leu Lys  
 900 905 910  
 Asp Phe Leu Ser Gln Pro Ser Leu Gly Leu Leu Val Arg Thr Tyr Pro  
 915 920 925  
 Glu Leu Glu Glu Gly Val Glu Leu Leu Glu Ser Pro Pro His Arg Val  
 930 935 940  
 Asp Gly Pro Ala Asp Leu Asp Glu Ser Pro Leu Ala Phe Leu Thr Ser  
 945 950 955 960  
 Asn Pro Gly His Ser Leu Cys Ser Glu Gln Gly Ser Ser Ala Glu Thr  
 965 970 975  
 Ala Pro Glu Glu Thr Glu Gly Pro Asp Leu Glu Ser Ser Asp Glu Thr  
 980 985 990  
 Asp His Ser Ser Lys Ser Thr Glu Gln Val Ala Ala Phe Cys Arg Ser  
 995 1000 1005  
 Leu His Glu Met Asn Pro Ser Asp Gln Asn Pro Ser Pro Gln Asp Ser  
 1010 1015 1020  
 Thr Gly Pro Gln Leu Ala Thr Met Arg Gln Leu Ser Asp Ala Asp Asn  
 1025 1030 1035 1040  
 Val Arg Lys Val Ile Cys Glu Leu Leu Glu Thr Glu Arg Thr Tyr Val  
 1045 1050 1055  
 Lys Asp Leu Asn Cys Leu Met Glu Arg Tyr Leu Lys Pro Leu Gln Lys  
 1060 1065 1070  
 Glu Thr Phe Leu Thr Gln Asp Glu Leu Asp Val Leu Phe Gly Asn Leu  
 1075 1080 1085  
 Thr Glu Met Val Glu Phe Gln Val Glu Phe Leu Lys Thr Leu Glu Asp  
 1090 1095 1100  
 Gly Val Arg Leu Val Pro Asp Leu Glu Lys Leu Glu Lys Val Asp Gln  
 1105 1110 1115 1120  
 Phe Lys Lys Val Leu Phe Ser Leu Gly Gly Ser Phe Leu Tyr Tyr Ala  
 1125 1130 1135  
 Asp Arg Phe Lys Leu Tyr Ser Ala Phe Cys Ala Ile His Thr Lys Val  
 1140 1145 1150

Pro Lys Val Leu Val Lys Ala Lys Thr Asp Thr Ala Phe Lys Ala Phe  
 1155 1160 1165  
 Leu Asp Ala Gln Asn Pro Lys Gln Gln His Ser Ser Thr Leu Glu Ser  
 1170 1175 1180  
 Tyr Leu Ile Lys Pro Ile Gln Arg Ile Leu Lys Tyr Pro Leu Leu Leu  
 1185 1190 1195 1200  
 Arg Glu Leu Phe Ala Leu Thr Asp Ala Glu Ser Glu Glu His Tyr His  
 1205 1210 1215  
 Leu Asp Val Ala Ile Lys Thr Met Asn Lys Val Ala Ser His Ile Asn  
 1220 1225 1230  
 Glu Met Gln Lys Ile His Glu Glu Phe Gly Ala Val Phe Asp Gln Leu  
 1235 1240 1245  
 Ile Ala Glu Gln Thr Gly Glu Lys Lys Glu Val Ala Asp Leu Ser Met  
 1250 1255 1260  
 Gly Asp Leu Leu Leu His Thr Thr Val Ile Trp Leu Asn Pro Pro Ala  
 1265 1270 1275 1280  
 Ser Leu Gly Lys Trp Lys Lys Glu Pro Glu Leu Ala Ala Phe Val Phe  
 1285 1290 1295  
 Lys Thr Ala Val Val Leu Val Tyr Lys Asp Gly Ser Lys Gln Lys Lys  
 1300 1305 1310  
 Lys Leu Val Gly Ser His Arg Leu Ser Ile Tyr Glu Asp Trp Asp Pro  
 1315 1320 1325  
 Phe Arg Phe Arg His Met Ile Pro Thr Glu Ala Leu Gln Val Arg Ala  
 1330 1335 1340  
 Leu Ala Ser Ala Asp Ala Glu Ala Asn Ala Val Cys Glu Ile Val His  
 1345 1350 1355 1360  
 Val Lys Ser Glu Ser Glu Gly Arg Pro Glu Arg Val Phe His Leu Cys  
 1365 1370 1375  
 Cys Ser Ser Pro Glu Ser Arg Lys Asp Phe Leu Lys Ala Val His Ser  
 1380 1385 1390  
 Ile Leu Arg Asp Lys His Arg Arg Gln Leu Leu Lys Thr Glu Ser Leu  
 1395 1400 1405  
 Pro Ser Ser Gln Gln Tyr Val Pro Phe Gly Gly Lys Arg Leu Cys Ala  
 1410 1415 1420  
 Leu Lys Gly Ala Arg Pro Ala Met Ser Arg Ala Val Ser Ala Pro Ser  
 1425 1430 1435 1440  
 Lys Ser Leu Gly Arg Arg Arg Arg Arg Leu Ala Arg Asn Arg Phe Thr  
 1445 1450 1455

Ile Asp Ser Asp Ala Val Ser Ala Ser Ser Pro Glu Lys Glu Ser Gln  
 1460 1465 1470

Gln Pro Pro Gly Gly Gly Asp Thr Asp Arg Trp Val Glu Glu Gln Phe  
 1475 1480 1485

Asp Leu Ala Gln Tyr Glu Glu Gln Asp Asp Ile Lys Glu Thr Asp Ile  
 1490 1495 1500

Leu Ser Asp Asp Asp Glu Phe Cys Glu Ser Val Lys Gly Ala Ser Val  
 1505 1510 1515 1520

Asp Arg Asp Leu Gln Glu Arg Leu Gln Ala Thr Ser Ile Ser Gln Arg  
 1525 1530 1535

Glu Arg Gly Arg Lys Thr Leu Asp Ser His Ala Ser Arg Met Ala Gln  
 1540 1545 1550

Leu Lys Lys Gln Ala Ala Leu Ser Gly Ile Asn Gly Gly Leu Glu Ser  
 1555 1560 1565

Ala Ser Glu Glu Val Ile Trp Val Arg Arg Glu Asp Phe Ala Pro Ser  
 1570 1575 1580

Arg Lys Leu Asn Thr Glu Ile  
 1585 1590

<210> 7

<211> 9

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic  
 HA-tag sequence

<400> 7

Tyr Pro Tyr Asp Val Pro Asp Tyr Ala  
 1 5

<210> 8

<211> 80

<212> PRT

<213> Mus musculus

<400> 8

Glu Arg His Gly Val Ala Phe Tyr Asn Phe Gly Gly Ser Glu Ala Gln  
 1 5 10 15

His Leu Thr Leu Gln Ile Gly Asp Val Val Arg Ile Gln Glu Thr Gly  
 20 25 30

Gly Asp Trp Tyr Arg Gly Tyr Leu Ile Lys His Lys Leu Ser Gln Gly  
 35 40 45

30

Ile	Phe	Pro	Thr	Ser	Phe	Ile	His	Leu	Lys	Glu	Val	Thr	Val	Glu	Lys
	50					55					60				
Arg	Arg	Asn	Ile	Glu	Asn	Ile	Ile	Pro	Ala	Glu	Ile	Pro	Leu	Ala	Gln
65					70					75					80